

# **THE CAMPAIGN FOR HOMELAND DEFENSE--WHAT DO WE REALLY NEED?**

**A MONOGRAPH  
BY  
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Chemical Corps**



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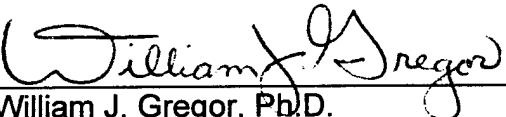
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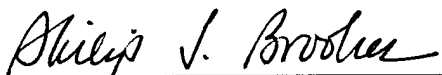
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## **ABSTRACT**

### **THE CAMPAIGN FOR HOMELAND DEFENSE-- WHAT DO WE REALLY NEED?** by Lieutenant Colonel Russell A. Bucy USA, 41 pages

Since the end of the Cold War, American military planners, government officials and the public have been engaged in intense discussions about the nature of the next threat. Chemical and biological weapons and their effect on where Americans live-- the homeland, have occupied a significant part of the debate. The Defense Against Weapons of Mass Destruction (WMD) Act of 1996, better known as the Nunn-Lugar-Dominici Act, tasks the Federal Government with preventing and responding to terrorist incidents involving chemical and biological WMD, and providing enhanced support to improve the capabilities of civilian emergency response. The Department of Defense has responded by creating small, widely scattered response teams.

The military response force mission is to support local emergency response teams and provide advice and coordination during WMD contingencies. This program is ineffective, as military teams cannot respond fast enough to be of assistance in a chemical or biological attack. Further study of the nature and effects of the chemical and biological threat indicate military response teams may be a wasted resource due to their late arrival on the scene and potency of the actual attack. However, the role of the military is important in providing training and development programs for civilian first response teams.

To align the DoD mission more closely with the intent of the Nunn-Lugar-Dominici Act, the conversion of the 470 military response positions to civil defense training positions is proposed. The proposed training program recalls the successful cooperative efforts of the World War II era War Department Chemical Warfare Service and the Civil Defense program, which used 323 training personnel at 12 sites to train over two million American civil defense first responders in domestic defense.

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## ABBREVIATIONS

BW.....	Biological Warfare
BWC.....	Biological Warfare Convention
CB.....	Chemical-Biological
CBIRF.....	Chemical-Biological Incident Response Force
CD.....	Civil Defense
CDC.....	Center for Disease Control
CWS.....	Chemical Warfare Service
CBW.....	Chemical-Biological Warfare
CWC.....	Chemical Warfare Convention
DoD.....	Department of Defense
DOM.....	Director of Military-Civil Support
DTRA.....	Defense Threat Reduction Agency
FEMA.....	Federal Emergency Management Agency/Act
HAZMAT.....	Hazardous Materials Team
HLD.....	Homeland Defense
ICS.....	Incident Command System
OCD.....	Office of Civilian Defense
PDD.....	Presidential Decision Directive
RAID.....	Rapid Assessment and Identification Team

USAMRIID.....US Army Medical Research  
Institute for Infectious Diseases

WHO.....World Health Organization

WMD..... Weapons of Mass Destruction

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## **INTRODUCTION**

“He who defends everything defends nothing”

- Frederick the Great

The specter of an emerging chemical and biological (CB) threat to America's cities has stirred interest in domestic preparedness programs among civilians, the media and the federal government. In reaction, the Nunn-Lugar-Dominici act gave the Department of Defense (DoD) responsibility for domestic preparedness against nuclear, chemical and biological (NBC) attack<sup>1</sup>. Recent DoD initiatives in response to Nunn-Lugar-Dominici are programs that provide a *response* to NBC attack, not programs that *prepare* state or local emergency response forces. Closer examination of the chemical-biological threat to the homeland reveals that military generated response forces are unnecessary and will provide “too little, too late”. In contrast, it is better to invest time and resources in training and equipping state and local response forces. A study of the viability of chemical and biological agents and their countermeasures are discussed with the intent of demonstrating that civil populations, with the right training, are just as capable or perhaps more capable of responding quickly to an attack as military forces will be.

This paper explores the CB agents most likely to be used in attacking the homeland and examines how best to respond to that threat. A proposal is made that a DoD homeland defense (HLD) force doctrine is flawed. A counter proposal recommends changing from centralized federal response to preparing civilian responders as the primary response capability for the nation. The Army's ten 22 person Rapid Assessment and Identification (RAID) response teams<sup>2</sup> and the Marine Corps 270 person Chemical Biological Incident Response Force (CBIRF) provide the backbone of the DoD response effort. That is 11 teams for a population of over 260 million, or less than one team for every 23 million Americans. This response force is almost insignificant as the first line of defense. These teams may even undermine efforts to develop a proper response to the CB threat (by siphoning resources and attention away from the real first responders).

Alternatively, fielding military response forces detracts from providing battlefield protection for combat forces engaged in the nation's major theater wars.

Chemical and Biological (CB) weapons are not new nor are they awesome. Armies and civil populations have prepared for CB attack for centuries, and have survived their use. The threat of CB attack for combat troops has been commonplace since World War One. Attack with CB weapons was expected during the Cold War. Certainly CB attacks against unwarned, unprotected civilians can be devastating and unsettling to the public. However, the ability of CB attack to cause widespread destruction and death depends entirely on the environment, quantity and type of agent. Simultaneously, the resulting diversion of DoD NBC defense forces to respond to CB attack within the homeland endangers DoD's ability to fight the nation's wars elsewhere.

While DoD units may not be needed to counter the CB threat, DoD has a responsibility to determine the direction of the defensive effort and to guide resources toward the most effective response. The nature of the CB threat alone indicates military assistance to civilian authority is required. The military must develop the training and provide the equipment civilian response forces will need.

Without a significant increase in the defense budget it will be difficult to provide a comprehensive homeland defense. Diverting military response forces to homeland response may be an invitation to disaster by relieving civilian authorities of their responsibilities in providing a share of "collective defense". In short, too much military involvement in homeland defense means less overseas capability, and a weak defense at home.

Undoubtedly, as the next century arrives, America faces many uncertainties abroad and possible attack by rouge nations, trans-national criminal groups, and terrorists. Extensive U.S. engagement in areas such as Kosovo, Bosnia, Iraq, traditional obligations in NATO and Korea, and a shrinking force structure prohibit DoD from effectively providing for both international engagement and homeland defense missions

simultaneously. In the 1997 DoD publication, "Proliferation, Threat and Response", Secretary of Defense William Cohen stated the issue succinctly: "...the United States faces a heightened prospect that regional aggressors, third rate armies, terrorist cells , and even religious cults will wield disproportionate power by using -- or even threatening to use -- nuclear, biological or chemical weapons against our troops in the field and our people at home."<sup>3</sup>

International efforts to limit the proliferation and development of CB weapons, such as the Chemical Warfare Convention (CWC) and Biological Warfare Convention (BWC) have reduced the proliferation of CBW among nations. Yet evidence continues to suggest that states and groups operating on the fringes of international approval continue to seek CB weapons. "DoD provides critical support to national and international prevention efforts. However, DoD understands that the United States will not be successful in preventing proliferation all the time and in all places."<sup>4</sup> The policy of engagement itself may invite attack on the homeland when we attempt to force others to surrender their WMD. This is expected of countries like Iraq or North Korea. Now trans-national terrorists, religious fundamentalists, or even domestic criminals can possibly employ CB weapons: "Countries like Iran, Syria and Libya use terrorism as a form of diplomacy and as an adjunct to their foreign policies". If, despite international treaty efforts proliferation is increasing, DoD must provide America with the best defense for civilians. This defense should be based on the strength of military training for civilian response forces, not by choosing to provide economy of force measures in developing limited military response capabilities.

Military *assistance* to domestic response is essential to develop training programs and procedures. This is a role that DoD's World War II predecessor, the War Department and Civil Defense organization, the Federal Emergency Management Agency's (FEMA's) predecessor, excelled at during the Second World War. A cooperative effort must be revitalized between civilian communities and the DoD to provide homeland self

defense. Based on the limits of threat agents themselves, the military challenge is to assist the public in their own defense, not to provide response forces. The issue is not dissimilar to the problem Frederick the Great contemplated over two hundred years ago-- attempts to protect and respond everywhere are really no protection at all.

## THE LIMITS OF THREAT AGENTS

Chemical and biological weapons are grouped according to their casualty producing effects. There are lethal (toxic) and non-lethal forms of chemical weapons. Biological weapons are categorized by levels of lethality and virulence among populations. Understanding the effects of each agent on unprotected populations and their limits of employment is necessary to determine which weapons are likely to be used in domestic attack.

Toxic chemical agents are grouped into two categories, standard and non-standard weapons<sup>6</sup>. Non-standard chemical agents include chemicals commonly found in modern industrial processes such as Chlorine or Phosgene (used in the dye industry) or other common industrial chemicals. Chlorine and Phosgene dissipate quickly, requiring a large volume of gas to achieve their results. They were used extensively during WWI, causing many casualties among unmasked, unprotected personnel. The danger imposed by these chemicals is no more serious than danger from an industrial accident, and well within the capability of civilian fire department s and hazardous materials teams (HAZMAT). The first German Chlorine gas attacks on the Somme between April and May of 1915 required 20,000 chlorine gas cylinders or the equivalence of 500 tons of chlorine employed along a four mile front to produce thousands of casualties, however the allied line still held and the gas was not particularly effective<sup>7</sup>. Considering the logistical effort required to produce the casualty effect, it would be impractical to use these agents covertly or effectively, making them poor choices for domestic attack. It might be possible for a terrorist or domestic criminal to cause an event to occur which would concentrate these chemicals. However, because both agents dissipate rather quickly, the best countermeasure to such an attack is evacuation of the downwind vapor hazard area. No other decontamination is required. These weapons were used in WWI because soldiers holding positions in the trenches could not evacuate.

The standard chemical agents are grouped into two sub-categories, incapacitating and toxic<sup>8</sup>. The incapacitating agents (i.e.; teargas, military designation -CS) have temporary effects. Although they produce tearing and difficult breathing, they generally do not produce long term casualty effects among healthy individuals. Therefore incapacitating agents also make poor domestic terror weapons.

The toxic agents can be lethal in small quantities. There are two types of toxic agents classed by physiological effect- blister and nerve. Blister agents were developed initially by the Germans during World War I. Used for the first time at Ypres in 1916, Blister agent (dichlorethyl sulfide or "H"), commonly known as mustard gas, is disseminated in vapor or liquid form and kills or disables by chemically burning the top layers of skin, causing systemic poisoning, or by inhalation of the vapor which burns the lining of the esophagus, trachea and lungs. In it's weaponized form, mustard agent can be detected as a brownish liquid smelling like garlic or mustard, from which the name is derived. Mustard agent produces latent effects rather than immediate casualties. Agent effects occur over a period of hours or days after initial exposure. Like chlorine or phosgene, large amounts of Mustard are required to produce casualties. The first Mustard attacks during WW I used 2,500 tons of gas loaded in over 1 million artillery shells and delivered over a three week period to produce 14,296 casualties<sup>9</sup>. The large concentrations of Mustard agent required over time make Mustard an unlikely agent for use against large civil populations. Hot soapy water is a good decontaminant available to most civilian fire departments.

The nerve agents Sarin (GB), Soman (GD), Tabun (GA), VX and a new Russian agent, Novichok, are the remaining members of the standard agent family. These agents are lethal in extremely small quantities. Nerve agents can be found in two forms, persistent and non-persistent. They produce casualties by interfering with nerve-muscle electrical impulses stimulated by the brain. The resulting nervous system failure causes respiratory collapse and stops heart function<sup>10</sup>. Of all the chemical agents, nerve agents are

the most likely chemical agents which might be used in an attack on the homeland. Their immediate effects, ease of concealment, and the small quantity of agent vs. casualty population produced make them particularly attractive. There are varying limits to the persistence of nerve agents, depending on the specific agent and weather conditions. They can be readily decontaminated using solutions such as bleach, or by heat on non-porous surfaces. A crude, non-persistent form of Sarin was used in the Tokyo subway attack by the Aum Shinrikyo religious sect in March 1995 with mixed effects.

Typically, Sarin evaporates at about the same rate as kerosene<sup>11</sup>, while Tabun and Soman can linger for one to two days depending on weather conditions. For Sarin, Tabun and Soman, this limits the way the agent can be used, and casualty populations would be generally localized to the immediate area of the attack with a limited downwind hazard.

Novichok and VX are highly persistent agents, and can be expected to remain at toxic levels for months under average weather conditions, longer in extreme cold, and can stubbornly remain at casualty producing levels even after decontamination. Although small amounts of these chemicals can produce casualties, the size of the casualty population remains dependent on the size of the area contaminated. For this reason nerve agents make moderately good terrorist weapons, but pose special employment problems. Anticipated casualty effects are extremely dependent on weather conditions and the methods of dissemination. Wide area dissemination in major cities is limited by the physical restriction of buildings, which tends to limit agent spread and alters factors such as wind speed and direction.

The technology needed to develop effective nerve agent weapons is beyond the reach of all but the most technologically sophisticated nations, and well beyond the resources of independent terrorist groups. Manufacturing nerve agents is complicated and requires high levels of laboratory discipline and specialized equipment to prepare quantities large enough to affect large populations. Transportation of large quantities of nerve agents to the target is also a problem. Unless many pounds of agent can be

distributed in a short period of time, (or a few pounds in an enclosed area, such as a subway system or building lobby) nerve agent effects may produce mixed results, albeit results which would require extreme care to contain.

The Aum Shinrikyo attack on the Tokyo subway on 20 March 1995 offers a glimpse into the adequacy of nerve agent weapons. Lack of sophistication and planning demonstrated by members of the Aum Shinrikyo cult attack produced mixed results from the standpoint of effectiveness. The poorly executed attack killed only 12 people but up to 5,000 were injured<sup>12</sup>. Although the attack devastated the target victims and quickly overwhelmed the decontamination and medical response resources, it did not result in irreversible property damage. With the exception of the 12 people killed, the primary casualty of the attack was the Aum Shinryko cult itself, which gained instant international notoriety and was just as quickly dismantled by Japanese and international authorities. This is a significant lesson for terrorists groups.

The difficulty in producing chemical agents and attack methods is a good example of the development challenges faced by trans-national groups and terrorists who might be developing CW weapons. "Most clearly, Aum demonstrated that a large, wealthy organization with several members who were well trained scientists can make and use chemical weapons on a small scale. What the affair demonstrates about the resources needed to produce chemical or biological weapons, however, or about the likely effects of terrorist chemical weapons attacks is far less clear. In this case, a group with large resources was surprisingly ineffective."<sup>13</sup> Smarter or more sophisticated terrorist organizations than Aum Shinrykyo might be able to orchestrate more effective attacks, however, they remain limited by complex manufacturing, handling and dissemination problems. The logistics of these difficulties may preclude chemical agents from being effective weapons of choice for domestic use.

The technology to produce military quantities of biological agents is easily accessible-- any pharmaceutical plant can manufacture the agents and most commercial or



research laboratories can conduct research or engineering. Weaponizing the agents into a viable delivery means to affect large populations in domestic attack is much more difficult than simply manufacturing them. If weaponization is achieved, the advantage these weapons offer over chemical weapons is that they are cheap, extremely easy to conceal and apply clandestinely, and with proper immunizations, they can be disseminated without the need for bulky or obvious protective equipment. In the 1950s and 60s, U.S. Army Chemical Corps Special Operations teams tested dissemination methods against unsuspecting U.S. cities. Subways in particular are ideal targets: "Within minutes the turbulence caused by the trains would carry the bacteria throughout the tunnel system...another technique used...was to travel on subway trains carrying an apparently normal looking light bulb which was in fact filled with bacteria. When no one was looking, the bulb would be dropped onto the tracks in the middle of a darkened tunnel."<sup>14</sup>

As easy as they are to disseminate, biological agents remain extremely fragile and susceptible to the surrounding environment which greatly reduces their viability. To achieve widespread effects, BW agents require either detonation or aerosol line dissemination to cover wide areas. Either form of dissemination will destroy some part of the agent, making their effects uncertain.

The Aum Shinrykyo cult also experimented with biological weapons, employing what many consider the most virulent bacterium and toxins available-- *Bacillus Anthracis* or *Anthrax*, and *Botulinum* toxins. "According to one account, in April of 1990, Aum attempted to attack the Japanese Parliament with botulinum toxin aerosol. In June 1993, the cult made a similar effort, this time targeting the wedding of the crown prince. Later that month, Aum reportedly also attempted to spray anthrax spores from the roof of a building in Tokyo. All three attacks failed to produce casualties."<sup>15</sup> Obviously, even large, wealthy and well organized efforts to disseminate the most virulent agents don't always succeed.

Weaponized biologicals include bacterias, *Rickettsia*, and common viruses such as *Tularemia*, *Venezuelan Encephalitis*, *Q-fever*, *Hepatitis A*, *Dengue* and *Yellow Fever* and bacterium's such as *Bacillus*, *Meningitis*, *Brucellas*, *Small Pox* and *Anthrax*<sup>16</sup>. There are also several different fungi, toxins and poisons included in the BW family which can be used against humans or agriculture. Only a few of these agents would be suitable as domestic attack weapons.

Bacteria are small, free-living organisms found everywhere. Weaponized bacteria such as *Anthrax*, *Cholera*, *Bubonic Plague*, *Pneumonic Plague*, and *Tularemia* can be easily grown, and are disseminated in aerosol form or through contaminated food and water. *Anthrax* causes an acute infection of the skin, lungs and gastro-intestinal tract. The fatality rate is approximately 25% for skin infections and 100% of pulmonary infected cases against un-immunized personnel. The *Anthrax* spore itself is extremely hardy, and can remain viable for many years in soil. A vaccine is available and antibiotics are the only treatment. Common decontamination techniques are steam under pressure, or exposure to dry heat above 284 degrees F<sup>17</sup>. *Anthrax* is the most common agent mentioned in the latest HLD literature, probably because the effects of a small quantity of *Anthrax* is usually 100% fatal. However, once delivered, *Anthrax* is not contagious, and control of the disease can be managed by prompt disposal of infection sources through burning or deep burial. The hardiness of *Anthrax* and the high mortality rate make it the most viable agent of choice for use in the homeland.

*Cholera* produces an acute gastro-intestinal disease with a mortality rate of 15% to 90% for untreated cases, but only 5% in treated cases. Unlike *Anthrax*, *Cholera* can easily spread within human populations, by direct contact with contaminated surfaces. Antibiotics and fluid therapy are the best treatments, and usually result in recovery. Prevention is easy as *Cholera* is normally spread through contaminated sewage<sup>18</sup>, simple hand washing and cleanliness is the best way to control epidemics. *Cholera* is an unlikely

agent for domestic attack because of the low fatality rates, and easy prevention and treatment.

The plague bacterias, *Bubonic* and *Pneumonic plague*, produce an infection with a mortality rate of from 25-50%, however, plague requires vectors (fleas rats etc.) for transmission. This bacteria is susceptible to sunlight, usually dying within 3-5 hours of exposure. The low survivability of the bacteria makes this agent a poor domestic attack weapon.

*Tularemia* is a septicemic (blood poisoning) disease, the symptoms often resemble typhoid fever. It is transmitted through the skin or lungs, however, it is not transmitted between humans. The mortality rate can range from 30-40% in untreated cases. Temperatures above 113 degrees F. and alcohol preparations will kill *Tularemia*<sup>19</sup>. The low temperature vulnerability, low mortality rate and low epidemic rate make *Tularemia* a poor domestic attack weapon.

The four biological agents in the *Rickettsia* family (*Epidemic Typhus*, *Endemic Typhus*, *Rocky Mountain Spotted Fever*, *Q Fever*) generally produce high fevers and skin rashes in man with a mortality rate of 2-40%<sup>20</sup>. *Q fever* is the only standard BW agent which might make a viable domestic attack weapon. *Q fever* is highly contagious, but all of the *Rickettsia* family are widely known to medical authorities, and easily treated.

Finally, there are three common BW virus agents, *Venezuelan Equine Encephalitis* (VEE), *Viral Hemorrhagic Fever* (VHF), and *Small Pox*. The encephalitic and hemorrhagic fevers are quite common in the developing world, where the mortality rate is near 1% or less. These viruses are also transmitted by vectors (fleas, mosquitoes, etc.) which makes them of limited use for domestic attack. The *Small Pox* virus, however, has a mortality rate of about 30%, and is highly communicable in humans. the symptoms consist of high fever, blistering and scabbing of the skin surface<sup>21</sup>. *Small Pox* is a very hardy agent, requiring exposure to alcohol or acetone for an hour, or temperatures of 212 degrees F. to destroy. Most people have been immunized against *Small Pox* which has been eradicated

as a biological agent. However, the former Soviet Union may have been developing new strains of this virus, with the intent of reintroducing it as a strategic weapon<sup>22</sup>. Because Small Pox has been eradicated, and immunization technology exist to combat it's effects, it currently cannot be considered a viable agent. If the World Health Organization, U.S. Centers for Disease Control and U.S. Army Medical Research Institute for Infectious Diseases (USAMRIID) decide to destroy their stocks of Small Pox virus samples, it could re-emerge as a serious viable agent.

The final category of known agents are *toxins*. Toxins are biologically produced poisonous compounds. Toxins are not strictly considered chemical weapons as they are more closely related to biological weapons. However, they are not contagious and require dissemination similar to chemical weapons. Toxin weapons (TW) and poisons fall into two broad categories, neurotoxins and cytotoxins. Neurotoxins typically paralyze the nervous system, while cytotoxins attack cells. *Tricothecenes* (T-2) are cytotoxins, and are considered non-lethal harassing agents<sup>23</sup>. T-2 development is most familiar as the "yellow rain" first described in Afghanistan and Kampuchea. These weapons are naturally occurring by-products of agricultural fungi. Although Yellow Rain use in Kampuchea is now almost universally discounted, these weapons can produce horrendous results if inhaled or ingested in large quantities. They are typically heavier than air, rendering attempts to aerosolize them quite difficult, requiring an explosive or other dust producing event to occur, which enables their dissemination. While there is no antidote, victims need general supportive care only. The agent is decontaminated with soap and water or bleach.

*Ricin* is a byproduct of the Castor Bean plant and another cytotoxin. It can be dried into crystalline or powder form<sup>24</sup>, but cannot be easily disseminated among large populations. In 1978, a Bulgarian dissident in London was assassinated with a tiny pellet the size of a pin head containing the toxin *Ricin*. The toxin was injected into the victim with a gun designed to look like an umbrella<sup>25</sup>. The inability of cytotoxins to affect large

numbers of people make them useful as poisons, but far less useful as domestic terror weapons.

The neurotoxins *Botulinum* and *Saxitoxin* are common poisons found in food and shellfish. They are similar to the poisons found in snake venom. There is no known cure, except supportive therapy. *Saxitoxin*, occurring naturally in shellfish, is very difficult to synthesize, making it a poor domestic weapon. Although *Botulin* toxin is best disseminated in foods it has also been weaponized with uncertain effects. In 1942 Nazi SS leader Reinhard Heydrich was assassinated by hand grenades supposedly laced with *Botulin* toxin provided by the British CBW establishment at Porton Down<sup>26</sup>. On larger scales, suspected military use of toxins such as T-2 toxins in Afghanistan and Kampuchea require sophisticated delivery methods involving rockets and bombs which are difficult to properly develop and not likely to be used domestically.

A remaining aspect of "non-lethal" BW agents is their utility in agricultural warfare. Specific biologicals such as *Anthrax* (primarily found in livestock) or fungi might be used to attack animals or crops and the environment which support a nation's economy and food production. This could be done covertly to ruin the economic base and moral of a nation or to influence politics or engagement actions abroad. Ruining a nation's export base may make the attackers own markets more valuable. In 1945, the U.S. prepared for such warfare: "...the Americans also had a range of biological anti-crop agents which they were capable of mass-producing: exotic-sounding fungi like *Sclerotinia rolfsii* (agent C) which rots the stems of tobacco plants, soya beans and sugar beets, sweet potatoes and cotton; *Phytophthora infestans* (Mort) de bary (agent L O) which causes late blight in potatoes; *Piricularia oryzae* (agent I E) a fungus which attacks rice; and *Helminthosporium oryzae* van Brede de Haan (agent E), the cause of 'seedling blight' and 'brown spot' on young rice plants."<sup>27</sup>. Agricultural bio agents are not of immediate concern, but fall into a category of agents which requires attention but no response from military response teams. There are no medical or decontamination processes which will

mitigate agent effects on crops. The only defense required against these agents is continued horticultural research and development by the U.S. Department of Agriculture.

Developing techniques in gene splicing has allowed man to alter BW agents to the extent they may not resemble their naturally occurring parents. By deliberately altering biological agents, they are difficult to recognize or treat by anyone other than their creators. A second frightening aspect of the genetic engineering of biological weapons is the possibility they can be genetically altered to optimize human ethnic and racial differences: "Ethnic weapons can be described as weapons suitable to kill or damage specific ethnic groups. Ethnic weapons would employ differences in gene frequencies among specific populations to incapacitate or kill a selected target population."<sup>28</sup>

Evidence of biological weapons research in the former Soviet Union indicates the development of new strains or combinations of bio agents such as Anthrax and Small-Pox specifically bio-engineered to enhance their effects. Development of these agents is particularly insidious as it may allow them to overcome natural weaknesses and susceptibilities normally limiting their use or contravening accepted medical treatments. Man has within his grasp the ability to manipulate these agents. In his 1986 futuristic technical review, Biological and Toxin Weapons Today Erhard Geissler made the following prediction: "Further possibilities (to develop new BW agents) are presented by the growing battery of "genetic engineering" techniques ...Such methods might, in the distant future, lead to a strain of pathogen so different from its parent as to be classified as a new disease agent."<sup>29</sup>

As frightening as these possibilities may be, not every nation or group can acquire them easily. In an interview with the Public Broadcasting Service, Dr. Knattjan Alibekov, former First Director of the Soviet Biopreparat, stated "Its a long technological process. If we are talking about sophisticated [bio] weapons, it's quite difficult. Regular ordinary terrorists wouldn't do this and cannot do this."<sup>30</sup> This underscores the difficulty terrorists and trans-national groups would confront in acquiring these weapons.

The development of many types of BW weapons is limited to states with the resources and collective knowledge necessary to employ BW- "...growing biological agents is quite simple , but turning these agents into potent military instruments -- which requires both reasonable shelf life for storage and transport, and efficient dispersal in stable, respirable aerosol -- is substantially more difficult. Iraq, despite years of effort and multi-million dollar investments, does not appear to have been able to produce high performance biological agent preparations, relying instead on relatively inefficient liquid slurries."<sup>31</sup> Limits to the acquisition and employment of these weapons make many of them undesirable for use on a large scale. One of the most effective countermeasures in the U.S. was the closing of biological supply services to non-credentialed individuals<sup>32</sup>, making it almost impossible to acquire bacteriological organisms.

Biological agents can be manufactured for use against people or against agriculture. In this respect, they might be the perfect domestic terrorist weapon- silent in employment and undetectable in use. There is little that can be done from a military response force perspective to defend a population from attack. For these reasons, despite the difficulty in producing viable weapons, BW systems stand out as perfect weapons for use in domestic attack. However, defending against BW agents is a matter requiring medical and technological research and preparation, not preparing military response forces. "We need to stop thinking that biological weapons are very terrifying and we can't find any protection. We can't forget the ultimate objective...when we talk about bio defense...to save peoples lives...we need to start developing medical defense, because medical defense is able to protect people against biological weapons."<sup>33</sup> Medical defense is pre- and post-treatment, preferably pre treatment, which renders the weapon ineffective and negating it's use. Even if BW weapons were acquired by terrorists or trans-national groups who managed to employ them, what could military response forces achieve to limit their effects?

## **REDUCING THE CHEMICAL AND BIOLOGICAL THREAT**

In the latest military catch-phrase, there is much discussion about the terms *symmetrical* and *asymmetrical* warfare. Webster's New World Dictionary defines Symmetry as "...correspondence of opposite parts in size, shape and position..."<sup>34</sup>. CBW weapons are lethal, highly mobile, readily accessible, almost undetectable until used, and difficult to defend against. These aspects make them attractive for nations and groups without the capability to respond symmetrically to conventional military forces, by making the more conventional force's homeland susceptible to attack. However, close analysis reveals chemical and biological warfare agents are not new, have been used repeatedly in warfare on civilian populations and military troops, but are not the ultimate weapons they seem. The historical use of mustard (blister or "H" agent) on populations is provided in Table 1 to illustrate this trend.

**TABLE 1**

### **HISTORICAL USE OF MUSTARD AGENT**

<b>Date</b>	<b>User</b>	<b>Opponent</b>	<b>Place Used</b>
1920-25	U.K.	Rebels	Middle East
1925	France	Morocco	Fez
1930's	USSR	Basmatch Tribes	Central Asia
1935-36	Italy	Abyssinia	Abyssinia
1937	Japan	China	Yangtze Front
1939	Germany	Poland	Warsaw
1939	Poland	Germany	Jaslo
1963-67	Egypt	Yemen	Yemen
1976-79	Vietnam	H'mong Tribes	Laos
1979-80	Vietnam	Kampuchea	Kampuchea
1982	Iraq	Iran	Tigris Marshes
1982-86	Iraq	Kurds	Northern Iraq

Source: Mustard Gas the Science of "H", NBC Defense and Technology International, September 1986. p.70.



The international effort to control the use and spread of CBW stemming from these historical instances is not new either. In 1969, the United States unilaterally renounced first use of chemical and biological weapons (CBW). Subsequently the 1972 Bacteriological Warfare Convention (BWC) prohibited the development, production or stockpiling of biological weapons (BW) including toxin weapons (TW). This was followed by the signing of the Chemical Warfare Convention in 1992 and its subsequent ratification, making the U.S. a non-possessor state (except for stocks of CW weapons currently in the process of destruction). As a "non-possessor state" a CB weapon used to attack U.S. forces or populations would be deemed an *asymmetrical* attack. This strategic scenario has become the nexus for U.S. CBW counter proliferation, overseas engagement and homeland defense efforts. The Nunn-Lugar-Dominici effort for combating the CBW threat is a threefold plan: 1) dismantling weapons at their source; 2) preventing CB proliferation abroad; 3) preparing homeland defense.

For the foreseeable future, our National Security Strategy requires flexibility and a multi-polar focus of engagement to prevent the spread of these weapons. Considering trends since the end of the Cold War, we can look forward to combinations of emerging powers, trans-national criminals and terrorists who possess formidable technologies and advanced arsenals of weapons of mass destruction well out of proportion to legitimate political and military needs. So far, the efforts of counter-proliferation appear to be gaining momentum.

To discourage the development and proliferation of CBW weapons under the Nunn-Lugar-Dominici initiatives, DOD activated the Defense Threat Reduction Agency (DTRA) on 1 October 1998. The 2,089 personnel of DTRA are charged with the responsibility of reducing the NBC threat to the U.S. and its allies. DTRA "executes technology security activities; cooperative threat reduction programs; arms control and treaty monitoring and on-site inspection; force protection; nuclear, biological and chemical

defense and counter-proliferation.” The agency also provides “...technical support on weapons of mass destruction matters to Department of Defense organizations.”<sup>35</sup>

Saddam Hussein’s apparent failure to use chemical or biological weapons during the Gulf War is evidence that governments or groups with chemical or biological capability no longer have a need for such weapons, or fear the consequences of using them. After Desert Storm General Schwarzkopf postulated that a variety of reasons may have prevented the Iraqi’s from using chemical and biological weapons- the destruction of Iraqi delivery capability, damage to CB production sites or Iraqi concerns about the possibility of nuclear retaliation might be a few of the reasons<sup>36</sup>. The dismantling of the Aum Shinryko cult sends a similar message-- If terrorists use CB weapons, the strongest international reaction is to eradicate the aggressor employing these weapons.

In the heat of warfare the possibility that CB possessing states or groups might have learned a different lesson from the Gulf War (i.e.; Allied victory might have been prevented or at least tempered by a few thousand military casualties on the battlefield, or a few thousand civilian casualties in Tel Aviv, Riyadh, Damascus or Washington D.C.) remains a possibility. There is a perception, largely influenced by the media, that such events may alter the political aims of governments, and the will of nations. This perpetuates discussion of the vulnerability of the homeland.

Chemical and biological warfare conjures antique images of soldiers in gas masks storming the trenches during the First World War or perhaps the apocalypse depicted in a number of Hollywood films. These images have taken on the quality of reality, despite apparently successful efforts to control the production and use of CBW. The media has successfully capitalized on the emotional impact of CB weapons and various aspects of WMD. There are now over 300 WMD Internet sites illustrating this point. Interest in WMD is also fueled by combinations of scientific fact, public concern, and sometimes pure fantasy. The pre-occupation with biological weapons is manifested in Richard

Preston's best selling book, "The Cobra Event" depicting a biological attack on New York City. The book has the following comment on the back cover:

"THE BOOK THAT PETRIFIED THE PRESIDENT-- Mr. Clinton was so alarmed by ...THE COBRA EVENT, which portrays a lone terrorist's attack on New York City with a genetically engineered virus-- that he instructed intelligence experts to evaluate it's credibility.<sup>37</sup>

The President's concerns and public reaction notwithstanding, bio-engineering requires sophistication and materials beyond the reach of many nations, let alone trans-national groups, as explained previously. However, media and public interest in all aspects of WMD continues to generate debate concerning the possibilities of attack against the homeland- why? Because U.S. engagement policies since the end of the cold war make an attack with asymmetrical weapons *seem* more likely as the U.S. becomes engaged with non-traditional adversaries who do not have the power to challenge symmetrically. As national and local governments prepare for CB disaster response, debate about the right types of programs has gravitated away from the threat and towards immediate short term solutions, resulting in the short sighted DoD position of developing response forces for CB contingencies. This is a natural solution for a military trained to conduct contingency warfare, but not for defense against the most likely threat agents which could be used against U.S. civil populations by foreign or domestic enemies.

CB weapons are increasingly viewed as strategic tools to challenge regional stability. To set the stage for a discussion of chemical and biological weapons, we must examine employment philosophies. The extensive use of chemicals during WW I produced over a million casualties from chemical weapons,<sup>38</sup> and resulted in a grudging acceptance of chemicals as a tactical battlefield reality. As a tactical weapon the unpredictability of the effectiveness of chemicals was not the solution to break the stalemate in the trenches. However, CB development continued in an effort to inflict maximum terror on *unprotected* civilian populations or *unprepared* troops. The rational

for developing and using chemical or biological weapons remains the same today as it did in 1918. However the evolution of these weapons from the tactical to the strategic realm requires international engagement in accomplishing the first two steps of the Nunn-Lugar-Dominici program-- dismantling at the source and counter-proliferation. The success of these two parts directly influences homeland defense.

The demand for military chemicals has resulted in a willingness by major industries to provide components and precursor chemicals to many third world nations and trans-national parties. Today, twenty-five countries possess or are suspected of possessing<sup>39</sup> quantities of chemical and biological weapons, a reduction from the nearly thirty suspected and declared countries in 1985. But despite the many production challenges and contrary to the effects of world opinion, proliferation continues. Table 2 lists the suspected and possessing countries.

**TABLE 2**  
**POSSESSOR NATIONS**

<u>Biological Weapons</u>	<u>Chemical Weapons</u>
<u>Declared Possessors</u>	
	India, Russia, U.S. (all scheduled to destroy stocks under CWC)
<u>Suspected Possessors</u>	
China, Egypt, Iran Iraq, Israel, N.Korea, Russia, S. Korea, Syria, Taiwan, Vietnam	China, Cuba, Egypt, Iran, Iraq, Israel, Libya, Myanmar, N. Korea, Pakistan, Syria, Taiwan, Yemen, Yugoslavia

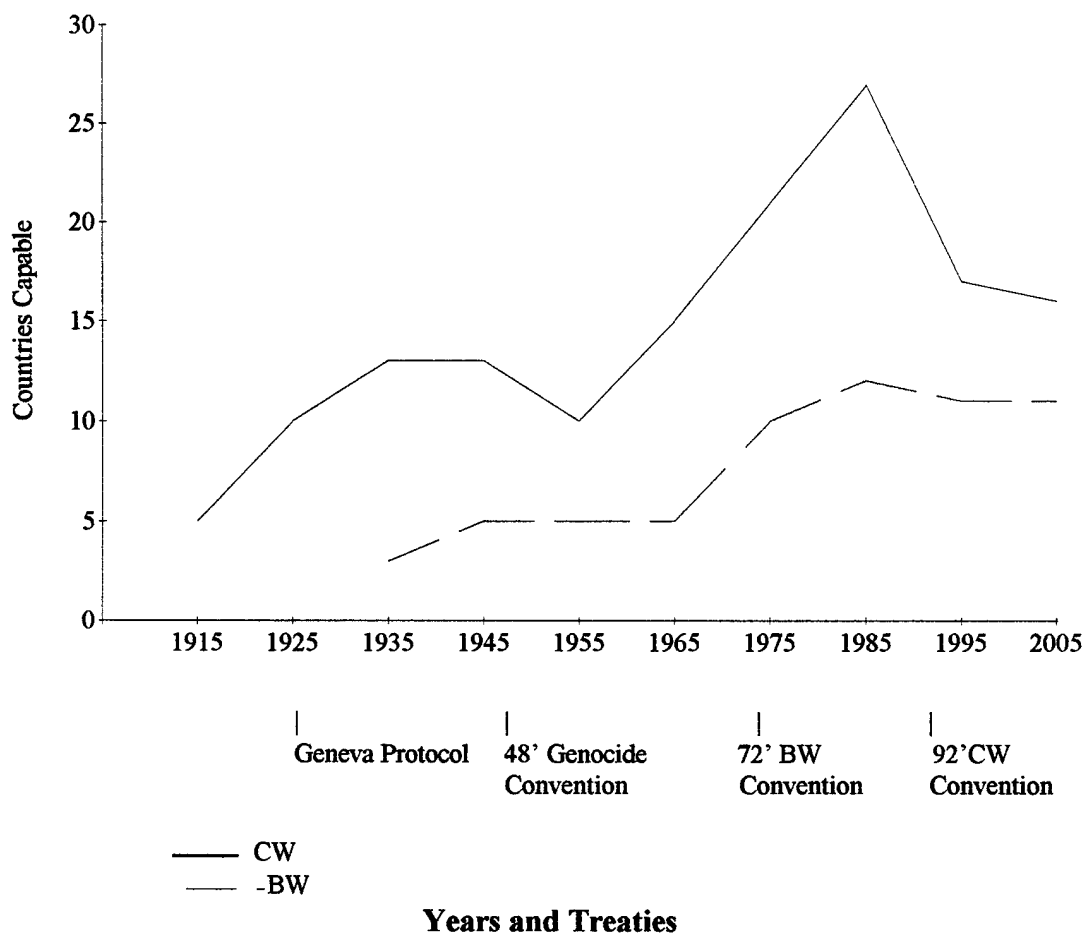
Source: America's Achilles' Heel, Richard A. Falkenrath, et al.  
MIT Press 1998 .

The downward trend in acquisition of CB weapons is encouraging, possibly making their use less likely. Possessing CB weapons may still serve political purposes, but is not an indicator of immediate use. A nation may choose to develop CB weapons to deter potential adversaries. The principle of retaliation is a strong strategic deterrence. As an element of power, CB weapons offer economy of force options: "...Israel relies on the nuclear option to deter the massive conventional threat from Arab states (much as the U.S. and NATO strategists considered nuclear weapons essential to balance massive Soviet conventional superiority in Europe). The Arab states, in turn, defend their reliance on chemical and biological armaments as the "poor nations equivalent of nuclear weapons." The conventional and non-conventional arms races are inextricably linked."<sup>40</sup>

Therefore, a nation may choose to develop and retain CB weapons to counter more effective military organizations and weapons. Additionally, the use and possession of CB weapons lends power to the nation out of proportion to their actual political importance. "...a technological revolution promised to accord smaller nations the ability to contest militarily and economically (at least locally) the world powers... Revitalized ethnic and religious forces began challenging traditional power elites, if not the very existence of a variety of states..."<sup>41</sup>.

This trend is showing decline as an increasing number of nations forsake CW weapons for political solutions based on legitimacy. Table 3 illustrates a decline in CBW weapon possessing states since 1986.

**TABLE 3**  
CBW PROLIFERATION AND ARMS CONTROL



Despite international efforts to prevent WMD from falling into the hands of rouge nations, terrorists, trans-national criminals, or domestic extremists, it is almost impossible to stem the flood of CB technology. A few states or groups incapable of challenging the U.S. may be able to reach into the heart of America with CB weapons, regardless of their limits. Advances in science, information technology, and the relaxing of security in the wake of the Cold War has increased opportunities to acquire CB weapons or offers scientists and technicians formerly employed in CB research to market what they know for profit.

In the past, developing nations have sought chemical weapons for a variety of reasons: ease of production or acquisition; the production base is easy to conceal; compared to sophisticated "high tech" weaponry chemicals and biologicals are inexpensive to produce; and CB weapons produce terrifying results either by producing casualties directly or by denying use of facilities by contamination. Small industrial challenged nations and groups perceive chemicals to be a "bigger bang for the buck" and an effective economy of force weapon. However, world opinion and strong CBW defensive programs are mitigating the threat. As stated previously, these weapons are limited in their scope and declining among nations, thanks in part to a realization that a defense can be mounted against them. Creating a military response force to defend against them is certainly warranted on the battlefield, but not domestically.

## **HISTORICAL FAILURE OF FIRST RESPONSE**

Perhaps there is an example that will illuminate what a CB attack might be like. On the night of December 2nd 1943, 105 Junkers JU88 bombers of Frieher Von Richtofen's Luftflotte 2 completed a bombing run over the Italian port city of Bari on the Adriatic Sea. Below, 17 Allied ships lay damaged or sinking in the harbor, among them the 10,000 ton Liberty ship, S.S. John Harvey. The John Harvey's cargo of one hundred tons of mustard gas bombs burned, then exploded, generating a thick black cloud which drifted over the city. John Harvey's crew and ten U.S. Army Chemical Warfare Service escorts aboard died in the explosion, leaving no one to warn the unsuspecting Italian town or allied garrison. An estimated 678 allied servicemen and over 1000 civilians who came into contact with the mustard agent died despite intensive medical treatment, many of them rescuers who responded to the initial attack<sup>42</sup>. Could the same thing happen today in an American city?

Today, Bari is remembered by tourists and pilgrims visiting the tomb of Saint Nicholas (Santa Claus), it's most famous landmark. Bari is not remembered for the events of 1943. Proof that the destruction wrought by weapons of mass destruction (WMD), although horrific, is survivable. Despite the fact that Bari had no military response force, the town recovered. Even if 22 RAID team members or 250 CBIRF members had been present, it is doubtful that the incident could have been mitigated because most victims were contaminated in the initial hours after the incident. Contamination was so widespread that decontamination was impossible. As at Bari, initial survival in WMD may be more matter of chance than a matter of preparedness. However, once the attack is recognized, continued survival depends on measures instilled prior to attack, not on a late arriving response team. Few personnel at Bari recognized the tell-tale smell of garlic, indicating the presence of mustard gas, an obvious failure in training. Medical treatment of the latent agent effects was the most pressing need at Bari.



The possible consequences of a terrorist attack on America's homeland has generated debate over the best means to prepare for homeland defense. Surviving by planning "homeland response forces" is shortsighted. The limits of CB attack and international efforts to restrict the spread of CBW are working. Analysis of the history of incidents of CB attack on populations and understanding the mechanisms of employment of modern chemical and biological agents demonstrate CB attacks are indeed survivable. To prepare for homeland defense without bankrupting the nation or borrowing resources from military forces which might be needed elsewhere or already be elsewhere requires planning. To be sure, the effects of even small quantities of chemical and biological weapons domestically has great emotional impact. However, emotional impact alone must not cloud judgment in planning the *right* defense. Presidential Decision Directive 39 (PDD 39) signed in 1995, designates the FBI as the "lead federal agency for the management of all terrorist crises, including those involving NBC weapons, that occur in the United States."<sup>43</sup> Although a landmark document in preparation for HLD, PDD 39 falls short of providing the necessary guidance to integrate civilian and military agencies of the U.S. Government and civilian localities into a uniform defensive apparatus. PDD 39 also instructs federal agencies to bear the costs of preparing for HLD out of their own budgets, a position guaranteeing competition with other departmental programs and contingencies. While the Army has the DoD lead in coordinating the actions of the Army National Guard, Forces Command (FORSCOM) and Chemical-Biological Defense Command (CBDCOM) through the Director of Military-Civil Support (DOMS), there is no corresponding federal effort to link the military to the Federal Emergency Management Agency (FEMA), the civilian defense apparatus. This is a critical shortfall in preparing civilian communities to respond to domestic attack.

The Army's ten raid teams correspond to FEMA's ten regions<sup>44</sup>. As such, the RAID teams mission is threefold-- to assess an event, advise civilian responders and to facilitate requests for assistance. The team is "...designed to support the incident

Commander and local emergency responders. The RAID [*sic*] is neither designed or intended to replace functions carried out under the Incident Command System (ICS) nor to replace those functions normally performed by the emergency first responder community. Where these systems are in place, formal request for assistance will flow through them, and any support provided is done in conjunction with support being resourced through the ICS.”<sup>45</sup> However, a significant criticism of the federal force is-- “In several cities, leaders are appalled at how poorly the military understood the realities of emergency response in a civilian, as opposed to a battlefield environment. The Department of Defense does not understand dealing with urban terrorism.”<sup>46</sup>

Under the current concept the RAID team will arrive too late to effectively assist local communities. Local communities must plan to support themselves during the initial hours of an attack. In another PBS interview, Dr. Michael Osterholm of the Minnesota Department of Health sums up the problem: “...very little to almost nothing has been done at the state and local level to prepare public health, to prepare medical providers, to provide for care teams for a biologic event. What we keep seeing are these people in space suits from federal agencies, who keep saying “We will come and help. We will take care of things. In the first instance, that will be so far after the fact that it will almost be needless.”<sup>47</sup> The emphasis must be placed on Federal training and preparation *before* the attack occurs. Federal response efforts arrive too slowly to be of assistance.

When federal agencies are called upon for help from civilian communities, there is a noticeable delay in response while approval is sought to authorize federal aid. This delay negates the utility of the federal response force. An analogy can be drawn to the incident at Bari, where few recognized the threat until it was too late to do anything about, and once it was recognized, proper post-attack medical treatment was the appropriate response. The functional components of this analogy are that effective response is a function of post-attack treatment and hazard avoidance based on initially recognizing the

threat. Something which can only be done through specialized training of local emergency responders and care providers prior to attack.

As established earlier, the effectiveness of a chemical attack is a function of contaminated area and downwind hazard. Both factors are controllable or escapable. Biological contamination however, depends on the agent selected and means of transmission. The microscopic nature of biological agents means detection will be more difficult than chemical agents. For this reason, biological agents should be considered the ultimate "first response" and follow-on challenge. Dr. Osterholm succinctly points out how first response teams fail: "We still believe that if we put money into our military, [sic] we put money into first responder programs, we will somehow prepare ourselves for bio-terrorism. It won't happen. It's going to be at the emergency room level, in the medical care area, in the health departments, in our vaccines, in our anti-biotics. If we don't have those we have nothing to prepare for bio-terrorism."<sup>48</sup> Bio terrorism effects will occur long after the initial attack, rendering federal military response forces inadequate. The real need is treatment, not response.

## **SOLUTIONS**

The nature of the threat and its limits, successful attempts to mitigate proliferation, and the fundamental failure of federal response agencies in providing an adequate defense were discussed previously. If counter-proliferation is working and the nature of the threat prevents successful employment of federal first response efforts, what is the alternative for providing effective defense measures? Discussing the CBW threat, Defense Secretary Cohen stated "The front lines are no longer overseas" in a 28 December 1998 interview<sup>49</sup>. If this statement is true, then the requirement to prepare civilian communities is imperative and providing "too little too late" federal response forces are the wrong answer.

A paradigm for a solution might be found in the U.S. Army Chemical Warfare Service (CWS) support of the Office of Civilian Defense (OCD) during World War II. Just as FEMA (OCD's successor organization) adequately fulfills today's responsibilities of Civil Defense, the RAID and CBIRF concept can fulfill the CWS role of WWII. A limited program of civilian first response "train the trainer" programs should replace the current military RAID and CBIRF response concept.

Recognition of DoD's limits in providing effective response forces is a significant step towards developing a civilian first response program. The personnel shortfall in the armed forces, combined with increased U.S. presence overseas simply means DoD has problems providing forces to support homeland defense, regardless of the importance of this mission. U.S. military forces overseas simply cannot respond to homeland defense scenarios quickly enough. When engaged in high levels of conflict, forces preparing for overseas movement, to include the National Guard and Reserves will be hard pressed to respond to CBW homeland response scenarios, precisely at a time when these scenarios are most likely to occur. This problem is similar to one experienced by the Chemical Warfare Service, which was charged with providing CD programs during WW II. When the strategic effort shifted from the defense of the homeland to overseas commitments in

WWII, resources for homeland defense became scarce, and shifted from military to civilian authorities: "...United Nations strength finally forced the Axis powers to assume the strategic defensive, which left them impotent to undertake serious actions against the U.S. mainland. At the time, shortages of manpower at home obliged the Army by 1943 to curtail every activity that did not contribute directly to military victory overseas."<sup>50</sup> Overseas engagement today is already stretching the post Cold War military to its limits.

The solution to WW II's homeland defense problem began in 1941 with a request from Fiorello LaGuardia, then director of Civil Defense, to the War Department to set up schools for the defense of civilians. The request was based on observations of the London "blitz", and the realization that civilians were a likely target of aerial bombardment with incendiaries and gas. The War Department's attitude ranged from do nothing to avoid the possibility of frightening the public to engaging in studies of the problem and positioning forces to counter the threat. As early as 1936, the War Department, specifically the Chemical Warfare Service, produced a document entitled "Passive Defense Against Air Attack."<sup>51</sup> This document discussed commanders options in assisting civilian efforts in responding to chemical air attacks.

Director Lagaurdia's request gained impetus during the immediate pre-war period, and after December 7th 1941, the request was fully acted upon. Using a base of 323 training personnel at 9 civilian universities and three military schools, thousands of American civilian CD workers (the equivalent of today's first responders) and over 2 million American civilians were trained or introduced to chemical warfare<sup>52</sup>. To be fair, the country was entirely mobilized, at total war and technically under martial law in many areas making it easy to conduct such a program. As it became more apparent that the allies were winning the war and homeland attack was no longer imminent, interest in the CD program waned. However, given today's interest in homeland defense combined with modern communications, a modest program could be revitalized to provide civilian response forces basic instruction.

The key to the success of the WW II civil defense program, as opposed to the current federal response force, was the awareness of civilians with the threat agents and their limits and capabilities as taught by the WWII military trainers. The military trainers themselves were familiar with the programs and equipment provided to CD forces, and could relate the needs of the local response forces to training and equipment readiness. To begin this process, today's military training programs must retain their tactical battlefield "flavor", while recognizing civilian CBW training programs and equipment is far different. Once accomplished, the remaining challenge is to convert the military response forces into a core of trained instructors, stationed at National Guard Armories and Reserve centers in the 10 FEMA regions. If there are 250 Marine CBRIF members, with varying skills, and another 220 RAID Team members (10 RAID teams x 22 personnel each), totaling of 470 military personnel involved in preparing the homeland for CBW defense, this task should not be difficult. WWII required only 323 military personnel to do the same mission. The key element to this solution is the interest of the civilian response force itself. It may actually take an incident to ensure their full participation in the program, just as December 7th 1941 was the catalyst which caused interest in CD programs during WWII.

Although not a DoD task, development of civilian protection programs and equipment must be accomplished by FEMA in conjunction with the DoD. Why DoD? Because DoD is the most powerful federal agency with the most expertise in tactical CBW defense in the world. FEMA must be charged with development and procurement of CB defensive equipment and doctrine, while advice on agents and defensive materials must be provided by the DoD, just as the Office of Civil Defense and the War Department cooperated during WWII.

Finally, the DoD should be charged with developing a cell of expertise in domestic preparedness from the 470 personnel charged with assisting civilian agencies. This separates the purely military mission of fighting the nations wars from actually conducting

civil defense. To expect combat troops to train for multiple missions involving the intricacies of civilian defense is asking too much. Combat troops can only supplement civilian agencies, not replace them.

## **CONCLUSIONS**

Analysis of the threat and the limits of chemical and biological weapons in the hands of terrorist, rouge nations and trans-national threats indicate there are limits to CB weapons which make their employment difficult, but not impossible within the homeland. The Department of Defense initiatives for homeland defense as outlined in the Weapons of Mass Destruction Act, (Nunn-Lugar-Dominici) and Presidential Decision Directive #39, are not met by fielding homeland defense military response forces. The 470 military personnel currently tasked with "first response" missions by DoD cannot hope to effectively accomplish this mission for 260 million Americans. An alternative is the development of training programs designed to enhance the capabilities of the true "first responders"- civilian police, fire department HAZMAT personnel, and medical providers.

There is reason to believe providing a strong defensive capability through a combination of counter-proliferation efforts, arms control at the international level, military defensive capabilities at the DoD level, and efforts at the lowest levels of civilian defense will be effective deterrents to a domestic terror attack. Treaties alone have reduced the threat from a high of thirty chemical capable countries in 1986 to twenty-five suspected countries today, with the hope that counter-proliferation efforts will reduce the total even farther, limiting the opportunities to acquire CW weapons.

While BW weapons continue to be a major concern, the effectiveness military first responders will have on the BW threat is minimal, at best a case of "too little, too late". Mitigating this threat is a function of the civilian ability to provide research, awareness and medical treatment programs during BW contingencies. Although military medical resources such as USAMRIID should supplement civilian research efforts, the scale of this effort need not exceed what is currently provided by the DoD. Federal efforts should focus on developing this capability in civilian resources under the auspices of the Federal Emergency Management Agency.



Historical data proves CB warfare is survivable, but must be prepared for at the lowest level, not with expansive federal response programs. In the case of bio-terrorism this is particularly important because of the length of time which elapses between exposure and first sign of agent effects. Immediate federal response using military response teams is needless in this case<sup>53</sup>. DoD can and should provide training and research resources for this effort, in association with other federal agencies. There is a historical model for a resource saving alternative to military first response forces in the cooperative efforts of the WW II War Department Chemical Warfare Service and Civil Defense agency <sup>54</sup>. This model should be studied and adopted to provide the best defense for civilian populations.

In the final analysis, military first response forces are tantalizing first solutions to a difficult problem, but they may detract from the overall mission for DoD as intended in the Nunn-Luger-Dominici Act. Federal response forces fail to increase domestic preparedness, enhance the capability of the federal government to respond, or provide enhanced capability to civilian response agencies<sup>55</sup>. A mission the DoD cannot afford to fail.

## ENDNOTES

1. Falkenrath, Richard, Newman, Robert D. and Thayer, Bradley, America's Achilles Heel. MIT Press, Cambridge MA. 1998. p 262.
2. United States Department of the Army. Draft Military Support Detachment (Rapid Assessment and Initial Detection) Operations. Washington D.C. 17 December 1998. p. 17.
3. Office of the Secretary of Defense, Proliferation, Threat and Response. Government Printing Office, Washington D.C. November 1997. p. iii.
4. Ibid. p. 77.
5. Sloan, Stephen, International Terrorism: Conceptual Problems and Implications Journal of Thought: An Interdisciplinary Quarterly, Vol. 17 No. 2 Summer 1982, p 23.
6. U.S. Army Chemical School, Tactical NBC Information Tool Version 1.0 Ft. Mclellan AL. [CD-ROM] 1 June 1998.
7. Harris, Robert and Paxman, Jeremy. A Higher Form of Killing. Hill and Wang, New York, N.Y. 1982. p. 10.
8. U.S. Army Chemical School, Tactical NBC Information Tool Version 1.0 Ft. Mclellan AL. [CD-ROM], 1 June 1998.
9. Harris, Robert and Paxman Jeremy, A Higher Form of Killing. Hill and Wang, New York, N.Y. 1982. p. 26.
10. U.S. Army Chemical School, Tactical NBC Information Tool Version 1.0 Ft. Mclellan AL. [CD-ROM], 1 June 1998.
11. Ibid.
12. Falkenrath, Richard, Newman, Robert D. and Thayer, Bradley, America's Achilles Heel. MIT Press, Cambridge MA. 1998. p 19.
13. Ibid. p 23.
14. Harris, Robert and Paxman Jeremy, A Higher Form of Killing. Hill and Wang, New York, N.Y. 1982. p. 159.
15. Falkenrath, Richard, Newman, Robert D. and Thayer, Bradley, America's Achilles Heel. MIT Press, Cambridge MA. 1998. p. 20

16. U.S. Army Chemical School, Tactical NBC Information Tool Version 1.0 Ft. Mclellan AL. [CD-ROM] 1 June 1998.
17. United States Department of the Army. TM 3-216, Technical Aspects of Biological Defense. Washington D.C. , January 1971. p. 22.
18. Ibid, p. 25-26.
19. Ibid, p. 23-24.
20. Ibid, p. 27-29.
21. Ibid, p. 30-31.
22. Alibekov, Kanatjan, Dr., Frontline Interview, Plague War. Public Broadcasting System, PBS Online, WGBH Boston, MA. Oct 1998, p 6.
23. U.S. Army Chemical School, Tactical NBC Information Tool Version 1.0 Ft. Mclellan AL, [CD-ROM] 1 June 1998.
24. Ibid.
25. Harris, Robert and Paxman Jeremy, A Higher Form of Killing. Hill and Wang, New York, N.Y. 1982, p. 197-198.
26. Ibid, p. 88-93
27. Ibid, p. 99
28. Geissler, Erhard, ed. Biological and Toxin Weapons Today, SIPRI. Oxford University Press, 1986 p. 13
29. Ibid.
30. Alibekov, Kanatjan, Frontline Interview, Plague War. Public Broadcasting System, PBS Online, WGBH Boston, MA. Oct 1998, p 15.
31. Falkenrath, Richard, Newman, Robert D. and Thayer, Bradley, America's Achilles Heel. MIT Press, Cambridge MA. 1998. p. 87.
32. Ibid, p. 99.
33. Alibekov, Kanatjan, Frontline Interview, Plague War. Public Broadcasting System, PBS Online, WGBH Boston, MA. Oct 1998, p 20.

34. Neufeldt, Gloria, ed., Websters New World Dictionary of American English. Simon & Schuster, New York, N.Y. 1988, p. 1356.
35. Office of the Assistant Secretary of Defense, Public Affairs News Release, Establishment of the Defense Threat Reduction Agency. 1 October 1998, p.2.
36. Schwarzkopf, H. Norman, GEN., "27 February 91 Central Command Briefing, Riyadh Saudi Arabia.," Military Review. September 1991. p. 107.
37. Preston, Richard, The Cobra Event. Ballantine Books. New York, N.Y. 1997. p. back cover.
38. Vogel, Frederic J., The Chemical Weapons Convention: Strategic Implications for the United States. Carlisle Barracks PA: Strategic Studies Institute, 8 January 1997, p. 2.
39. Schafer, Sussane M., Pentagon: "Chemical Biological Weapons Threat Growing", A.P. Athens Banner Herald 28 December 1998.
40. Steinberg, Gerald M., "Towards Real Arms Control In the Middle East", Issues in Science and Technology. Vol. IV. Summer 1989, p. 64.
41. Glantz, David M., "Challenges of the Future," Military Review, December 1991. p. 3-9.
42. Infield, Glen B., Disaster at Bari. Macmillan, New York N.Y., 1971, p. 1-239
43. Falkenrath, Richard, Newman, Robert D. and Thayer, Bradley, America's Achilles Heel. MIT Press, Cambridge MA. 1998. p. 269.
44. Office of the Assistant Secretary of Defense, Public Affairs News Release, Weapons of Mass Destruction Response Team Locations 1 October 1998, p.1-2.
45. United States Department of the Army. Draft Military Support Detachment (Rapid Assessment and Initial Detection) Operations. Washington D.C. 17 December 1998, p. 17.
46. Pattison, Kermit, "Who Will Survive?," George, July 1998, p. 86-89, 110-111.
47. Osterholm, Michael Ph.D. Frontline Interview: Plague War. Public Broadcasting System, PBS Online, WGBH Boston, MA. Oct 1998, p 18.
48. Ibid.
49. Schafer, Sussane M., Pentagon: "Chemical Biological Weapons Threat Growing", A.P. Athens Banner Herald 28 December 1998. [Internet Source]

50. Brophy, Leo P. and Fisher, George J. B, The Chemical Warfare Service: Organizing for War. Office of the Chief of Military History, U.S. Govt. Printing Office, Washington, D.C., 1959, p. 248.
51. Ibid, p. 230-231.
52. Ibid, p. 236-247.
53. Osterholm, Michael Ph.D. Frontline Interview: Plague War. Public Broadcasting System, PBS Online, WGBH Boston, MA. Oct 1998, p 18.
54. Brophy, Leo P. and Fisher, George J. B, The Chemical Warfare Service: Organizing for War. Office of the Chief of Military History, U.S. Govt. Printing Office, Washington, D.C., 1959, p. 229-250.
55. Falkenrath, Richard, Newman, Robert D. and Thayer, Bradley, America's Achilles Heel. MIT Press, Cambridge MA. 1998. p. 262.

## **BIBLIOGRAPHY**

- Adams, Thomas K. "Future Land Warfare-- Radical Destabilizing Effects of New Technologies." *Parameters*. Autumn 1998.
- Alves, Gasparini P. *The Interest of Non-possessor Nations in the Draft Chemical Weapons Convention: A Brazilian Case Study*. New York: Vantage Press, 1990.
- Arroyo Center Annual Report. Army Forces in Two-MRC Studies. Rand Corp. Santa Monica CA: March 1997.
- Biersener, Robert J. "Needed: Chemical Warfare Defense Doctrine." *Proceedings*, November 1986.
- Brophy, Leo P. and Fisher George J. B. *The Chemical Warfare Service: Organizing for War*. Washington D.C.: 1959.
- Brophy, Leo P., Chocrane Raymond C., and Miles, Wyndham D. *The Chemical Warfare Service: From Laboratory to Field*. U.S. Army in World War II, The Technical Services. Washington D.C.: 1959.
- Brown, Frederick J. "The Army and Society." *Military Review*. January-February 1997.
- Bunker, Robert J. *Five Dimensional (Cyber) Warfighting: Can The Army After Next be Defeated Through Complex Concepts and Technologies?* Strategic Studies Institute. Carlisle PA: March 10 1998.
- Carus, W. Seth, *The Genie Unleashed: Iraq's Chemical and Biological Weapons Production*. Washington: Washington Institute for Near East Policy, 1989.
- Cirincione, Joseph. "The Non-Proliferation Treaty and the Nuclear Balance." *Current History*. May 1995.
- Davis, Vincent ed. *Civil-Military Relations and the Not-Quite Wars of the Present and Future*. Strategic Studies Institute. October 30 1996.
- Defense Technical Information Center. *Preliminary Assessment of the Navy's Chemical Biological and Radiological Defense Common Skills*. Orlando FL, 1987.
- Falkenrath, Richard A., Newman, Robert D., and Thayer, Bradley, *America's Achilles Heel*. MIT Press, Cambridge MA. 1998.
- Fox, C. William Jr. "Sub Saharan Africa and U.S. National Interests-- Phantom Warriors: Disease as a Threat to U.S. National Security." *Parameters*, Winter 1997-98.
- Glantz, David M. "Challenges of the Future." *Military Review*, September 1991.

- Grau, Lester J. "Beaten by the Bugs: The Soviet-Afghan War Experience." *Military Review*. November-December 1997.
- Harris, Robert and Paxman Jeremy. *A Higher Form of Killing*. New York: Hill and Wang, 1982.
- Headquarters, Department of the Army. *FM 3-5, NBC Decontamination*. Washington, D.C.: 27 June 1990.
- \_\_\_\_\_. *FM 3-7, NBC Field Handbook*. Washington, D.C.: 27 June 1990.
- \_\_\_\_\_. *FM 3-100, NBC Defense, Chemical Warfare, Smoke, and Flame Operations*. Washington, D.C.: May 23, 1991.
- \_\_\_\_\_. *FM 8-285, NAVMED P-5041, AFM 160-11. Treatment of Chemical Casualties and Conventional Military Chemical Injuries*. Washington, D.C.: May 23, 1991.
- \_\_\_\_\_. *DA Pamphlet 50-3, The Effects of Nuclear Weapons*. Washington, D.C.: March 1977.
- \_\_\_\_\_. *FM 100-5, (Draft) Operations*. Washington, D.C.: June 1998.
- \_\_\_\_\_. *FM 101-31-1, Nuclear weapons Employment and Doctrine Procedures*. March 1977.
- Heller, Charles E. *Chemical Warfare in World War I: The American Experience, 1917-1918*. Leavenworth Papers No 10. Combat Studies Institute. Ft. Leavenworth KS: September 1984.
- \_\_\_\_\_. *Twenty-First Century Force: A Federal Army and A Militia*. Strategic Studies Institute. Carlisle, PA: June 14 1993.
- Infield, Glenn B. *Disaster at Bari*. New York: Macmillan, 1971.
- Institute for Defense Analysis. *Chemical Warfare Defensive Training for in the U.S. Armed Forces*. IDA Paper. Alexandria, VA, 1987.
- Jensen Kenneth M. and Wurmser, David, ed. *Is It Feasible to Negotiate Chemical and Biological Weapons Control?* Washington D.C. 1990.
- Joint Chiefs of Staff. *Doctrine for Joint Chemical Operations*, Joint Pub 3-11. Washington D.C. : 1991
- Joint Chiefs of Staff. *Concept for Future Joint Operations, Expanding Joint Vision 2010*. . Commander, joint Warfighting Center. Fort Monroe VA: May 1997.
- Kennedy, Cladia K. *The Age of Revolutions*. Strategic Studies Institute. Carlisle, PA: March 10 1998.

- Kleber, Brooks E. and Birdsell, Dale. *The Chemical Warfare Service: Chemicals in Combat*. U.S. Army in World War II, The Technical Services. Washington D.C.: 1966
- Laquer, Walter. "Postmodern Terrorism." *Foreign Affairs*. September/October 1996.
- Lee, Rensselaer W. "Post Soviet Nuclear Trafficking: Myths, Half-Truths, and the Reality." *Current History*. October 1995.
- Lovelace, Douglas C. Jr. and Young, Thomas-Durell. *Defining U.S. Atlantic Command's Role in the Power Projection Strategy*. Strategic Studies Institute. Carlisle, PA: August 1998
- Matthews, Lloyd J. ed. *Can America Be Defeated?* Strategic Studies Institute. Carlisle PA: July 1998.
- Medema, Jan, "Mustard Gas: The Science of H." *Nuclear Biological and Chemical Defense and Technology International*, V.1 no 4.
- Mendelsohn, Jack. "Arms Control: the Unfinished Agenda." *Current History*. April 1997.
- Metz, Steven. *America in the Third World: Strategic Alternatives and Military Implications*. Strategic Studies Institute. Carlisle PA: May 20 1994.
- \_\_\_\_\_. "Racing towards the Future: The Revolution in Military Affairs. *Current History*. April 1997.
- Office of the Secretary of Defense. *Proliferation: Threat and Response*. U.S. Govt. Printing Office. Washington D.C.: November 1997.
- Pattison, Kermit. "Who Will Survive." *George Magazine*. July 1998.
- Pelletiere, Stephen C. ed., et al. *Terrorism: National Security and the Home Front*. Strategic Studies Institute. Carlisle, PA. : May 15 1995.
- Pike, John. "The Ballistic Missile Defense Debate." *Current History*. April 1997.
- Preston, Richard. *The Cobra Event*. New York. Ballantine Books, 1997 (FICTION)
- Roberts, Brad. "Chemical Weapons: A Policy Overview." *Issues in Science and Technology*. Spring 1986.
- Rohde, A. *A National Guard Frontier of the Next Century-* A White Paper. Director, National Guard Bureau. Arlington VA: March 1998.
- Sagan, Scott D. "The Causes of Nuclear Proliferation." *Current History*. April 1997.
- Sims, Nicholas A. *The Diplomacy of Biological Disarmament*. New York: St., martins Press, 1988.



- Smithson, Amy E. "Playing Politics With the Chemical Weapons Convention." *Current History*. April 1997.
- Steinberg, Gerald M. "Toward Real Arms Control in the Middle East." *Issues in Science and Technology*. Summer 1991.
- Stockholm International Peace Research Institute: *The problem of Chemical and Biological Warfare, A Study of The Historical, Technical, Military, Legal and Political Aspects of CBW, and Possible Disarmament Measures*. New York: Humanities Press. 1973.
- Stunder, Mark et al. *Meteorological Analysis of CB Agent Dispersal in an Amphibious Environment— an Operational Perspective*. Germantown MD: April 15 1986.
- Tilford, Earl H. *National Defense Into the 21<sup>st</sup> Century: Defining the Issues*. Strategic Studies Institute. Carlisle PA: June 6 1997.
- Tucker, Jonathan B. "The Biological Weapons Threat." *Current History*. April 1997.
- U.S. General Accounting Office. *Soldiers Inadequately Equipped and Trained to Conduct Chemical Operations*. Report to Congress. Washington D.C.: 1991.
- \_\_\_\_\_. *Chemical and Biological Defense Emphasis Remains Insufficient to Resolve Continuing Problems*. Report to Congress. Washington D.C.: March 1996.
- Vogel, Frederick J. *The Chemical Weapons Convention: Strategic Implications For the United States*. Strategic Studies Institute, Carlisle PA : January 8 1997.
- Wirtz, James J. *Counterforce and Theater Missile Defense: Can the Army Use an ASW Approach to the Scud Hunt?* Strategic Studies Institute. March 27 1995.
- The White House. *National Security Strategy for a New Century*. Washington D.C.: May 1997.